are set out in a short introduction, taking the form of a question or set of questions and then setting out how the subsequent chapters provide answers. Clearly the editor has done more than just lend his name to the book.

Turning now to the specific contents, the advantages and disadvantages of a range of microorganisms are viewed in two sections. The first covers molecular cloning and subsequent expression for in vitro analysis, of normal and engineered proteins. The second considers alteration of expression of host proteins with emphasis being placed on the genetics of the specific organism. Two chapters make up a short third section concerning antisense 'pseudogenetics'. Moving upward in the evolutionary scale in the penultimate section consideration is given to the analysis of interacting gene products, largely in invertebrates. Rounding off the contributions, vertebrates are approached through transfected animal cells, in germ-line transformation and, lastly, in a chapter reviewing human molecular genetics and Duchenne muscular dystrophy.

The aim of the book is to provide answers to enquiries raised by investigators new to the world of genetics and molecular genetics about what can be achieved. This volume will serve if you are one of the uninitiated and are happy to have your answers placed almost exclusively in the world of motility and the cytoskeleton. In view of the strengths of the book, it is unfortunate, therefore, that the economic advantages accruing from double publication have not filtered through to a cover price set at a level likely to encourage personal purchase.

M. Landon

Protein Purification; By Jan-Christer Janson and Lars Ryden; VCH Publishers; Weinheim, New York, 1989; xii + 502 pages; £44.45, DM 124.00

This book will be a useful addition to any protein laboratory and almost essential reading for the many laboratories which have FPLC systems. I would also recommend it as student reading material. The work is easy to read and gives a comprehensive description of all major methods of protein purification.

Contributions to the book were made by researchers at university and from Pharmacia LKB Biotechnology. Although the authors have tried to make this an unbiased account of key techniques, the natural tendency to write about what is familiar shows through. The book stands out from existing literature in its relation of separation results to protein properties. This is done in a way which attempts to rationalize the methods used in protein purification and even provide a basis to predict the behaviour of proteins.

The work is divided into three parts, Part I is a general view of protein purification. It covers initial extraction and purification methods, fractionation strategy, monitoring the fractionation process and storage of the final product. The book then moves into the more elegant methods of fractionation which are covered in Part II on Chromatography and Part III on Electrophoresis.

Part II is the strongest part of the book taking up two-thirds of the total book volume. It is divided into several sections, each covering a specific method of protein chromatography. Each section is well written and goes through the basic theory of the technique, available media and practical advice and applications using the technique. Methods included are Gel Filtration, Ion Exchange, Chromatofocusing, Reverse Phase, Hydrophobic Interaction and some very strong sections on various modes of affinity chromatography.

The final part of the book is devoted to Electrophoresis. This part is also broken up into sections which cover specific methods. The sections are again well organized to give good basic theory as well as practical advice. The methods covered include Gel Electrophoresis, Isoelectric Focusing, Immunoelectrophoresis, Protein Recovery and Blotting Techniques. There is also a limited account of the exciting new technique of Capillary Electrophoresis.

In conclusion, I believe this book will be a much welcomed source of information for protein biochemists.

K.G. Cook

Protein Purification Applications: A Practical Approach; Edited by E.L.V. Harris and S. Angal; Oxford University Press; Oxford, 1990; xiv + 179 pages; £18.00 (paperback)

This book is a companion volume to another recent title in the 'Practical Approach' series entitled 'Protein Purification Methods'. While this earlier volume covered basic theory and methodology in protein purification, the volume reviewed here concentrates on specific applications of these methods. With the increasing commercial importance of proteins the protein chemist has been faced with a range of new challenges to his skills. These are addressed in Chapter 1 which covers the problems of scaling-up protein purification and Chapter 2 which examines the specific problems relating to purity in the production of proteins for therapeutic use, and discusses the various highly sensitive assays for contaminants such as viruses, pyrogens and nucleic acids. Basic techniques for proteins crystallography are covered in Chapter 3. Since the purification of membrane proteins often requires the modification of traditional protein purification techniques an

extensive chapter on this area is most welcome. At this stage one must criticise the absence of a similar chapter on glycoproteins, which only receives 3 pages over the two volumes. A further short chapter covers the restraints imposed and problems involved in purifying proteins for sequence analysis. The impact of DNA technology on protein purification is clearly defined in an informative chapter on engineering proteins for purification.

The remainder of the book, approximately one-third, is devoted to examples of protein purifications, the examples selected giving a broad overview of the approaches and methodologies available for the purification of a range of protein types.

An extensive list of suppliers and their addresses and a comprehensive index complete the volume.

The volume is presented in the usual format for this series, basic principles being described together with detailed protocols and sections on troubleshooting. Taken together, these two volumes provide a very welcome collection that updates the reader in the majority of methodologies available for protein purification.

John M. Walker

The Analysis of Peptides and Proteins by Mass Spectrometry; Edited by C.J. McNeal; John Wiley and Sons; Chichester, 1988; 322 pages; £39.95

'The Analysis of Peptides and Proteins by Mass Spectrometry' is an edited volume, containing the proceedings of the Fourth Texas Symposium held at College Station on April 17–20, 1988. The stated objective of this symposium was to attempt to develop a dialogue between mass spectroscopists and researchers active in the life sciences. The volume consists of 25 articles concerned with mass spectrometry and its application to biological problems. The symposium took place before the importance of electrospray and of matrix-assisted laser desorption as methods of ionization was widely recognised, and neither of these methods is covered in the proceedings. Consequently, the volume viewed from the perspective of 1990 seems peculiarly deficient.

There are 9 articles on plasma desorption, 8 of which are experimental and 1 is purely theoretical. At that time, plasma desorption was the method of choice for the ionization of high-mass biological molecules (relative molecular mass (RMM) >10000), as electrospray and matrix-assisted laser desorption were still techniques in their infancies. There are 9 articles describing work in which the method of ionization was keV-atom bombardment (fast atom bombardment or liquid secondary ion mass spectrometry), and 3 articles concerning thermospray. There is one article in the volume on laser desorption and ionization. Two articles are concerned with detectors for mass spectrometers. An article entitled 'The Oxime-Based Segment Synthesis of Cro' points out ways in which mass spectrometry could be even more useful in protein chemistry, in particular emphasising the desirability of a technique for quantitation of peptide mixtures.

Many of the papers on keV-atom bombardment are concerned with tandem mass spectrometry, and that by Biemann, Costello and colleagues provides fine examples of peptide sequencing by 4-sector mass spectrometry. Hunt and colleagues describe peptide sequencing using laser-induced photodissociation of ions trapped in a Fourier transform ion cyclotron resonance (FT ICR) spectrometer. The peptide ions were brought into the cell from an external ion source via quadrupole lenses. This exciting FT ICR technique does not seem to have been developed greatly in the intervening 2 years between symposium and this review, which contrasts sharply with the very considerable growth over the same period in the use of 4-sector mass spectrometry for peptide sequencing.

The articles by Geno and Macfarlane and by Mahoney and colleagues on detectors are among the most valuable in the volume, not having 'aged' since they were presented. Both address the problems of detecting efficiently very high-mass ions which by virtue of their masses have low velocities on approaching detectors. Finally, Grotemeyer presents a succinct yet thorough coverage of laser desorption (as of April 1988) and multiphoton ionization for mass spectrometry of peptides and proteins. Indications of the approaching importance of laser desorption from matrices are given in the coverage of Tanaka and colleagues first work with fine-metal containing matrices.

Overall, the volume is recommended as a nice summary of the state of the art in biological mass spectrometry in the summer of 1988.

P.J. Derrick

Colony Stimulating Factors: Molecular and Cellular Biology; Edited by T.M. Dexter, J.M. Garland and N.G. Testa; Marcel Dekker; New York, 1990; xvi + 475 pages. $135.00 (U.S.A. and Canada), $162.00 (other countries)

The emergence of the haemopoietic colony stimulating factors (CSFs) from biological activities to recombinant proteins of enormous clinical promise is one of the most impressive achievements in modern molecular cell biology. "Colony stimulating factors; molecular and cell biology" is a multi-author survey of the field which brings together, in a single volume, reviews on diverse aspects of these remarkable agents. The book opens with a discussion of the